

Water & Energy Related Research Needs

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Overview

- How much water related electrical demand is there actually out there now?
- Who is causing this water related electricity demand?
- How much will water related electricity demand increase during the next decade?
- What are water agency options?
- Policy recommendations and research needs?

Water Agency Peak Electrical Demand Characteristics

Energy Values		
	GWH	
<u>Planning area</u>	<u>AG & Water Pumping</u>	
PG&E	6,325	
SMUD	181	
SCE	4,051	
LADWP	163	
SDG7E	231	
BGP	16	
OTHER	446	
<u>DWR</u>	<u>8,865</u>	
	<u>20,278</u>	
State Total Consumption	264,824	
Source: Table 1-4, pg. 1-9 of CEC 2005 Demand Forecast Documentation (CEC-400-2005-036)		

- Peak demand estimates rang from 1,500 MW to 5,000 MW - CEC PIER Study to determine actual number
- Almost 70% of water used in the summer.
- Water agencies reduce their peak demand by almost 20% now.
- Water use varies by location and water rates. Outdoor water use greatest variable.

Who Is Causing Water Related Electrical Demand In California?

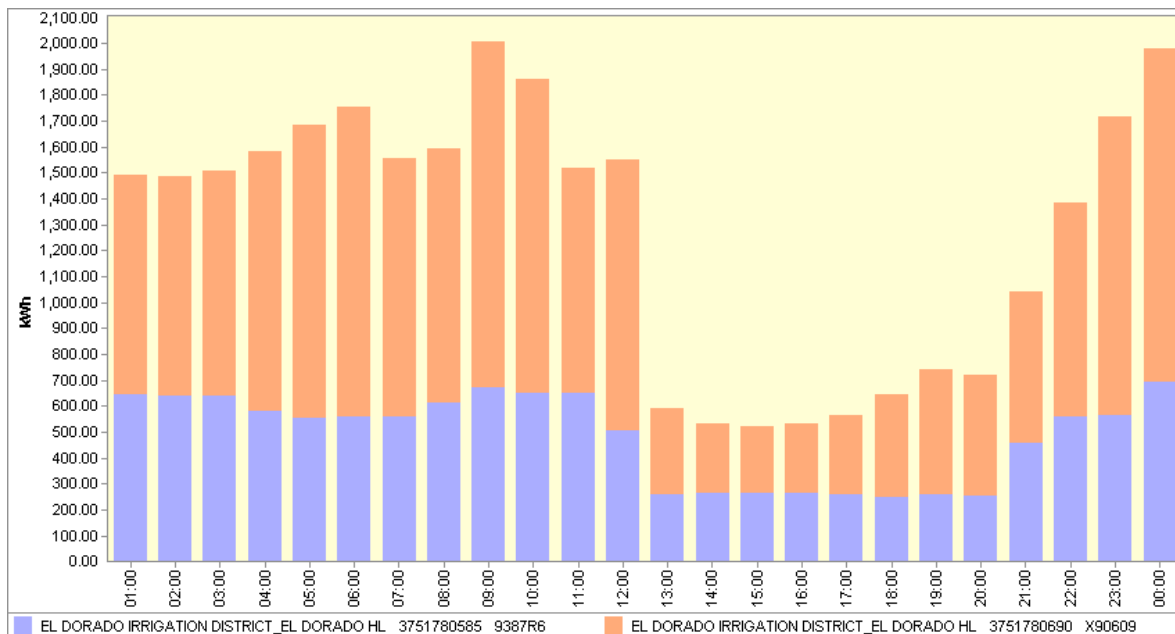
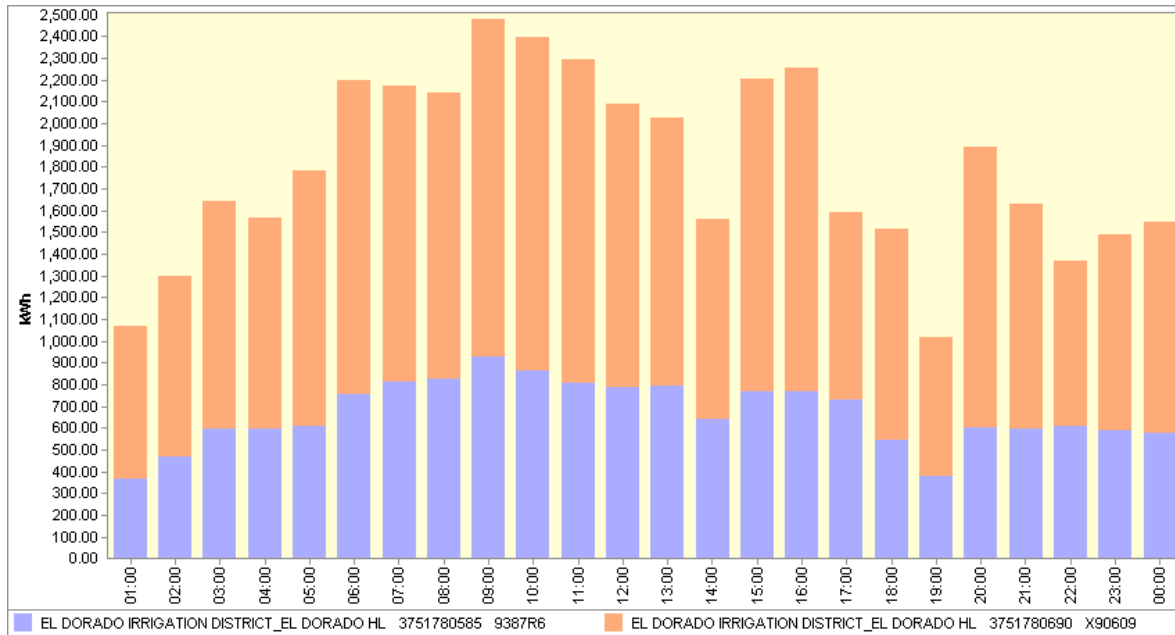
- Agriculture biggest use of water, but has low energy demand - most of ag bulk water supply gravity flow.
- Urban water use ~ 8.3 million acre-ft per year that must be treated, pumped, and wastewater treated.
- Urban Uses of Water
 - Large landscape - 7.2%, Commercial - 19.3%, Industrial 7.2%,
 - Energy - 1.2%, Residential interior - 37.3%, Residential exterior - 27.7%

How Much New Peak Demand From Water In Next Decade?

- Water agencies potential for increased demand + ~3,575 MW (next 10 years)
 - Existing conjunctive use in drought/dry years ~350MW
 - Proposed conjunctive use development/drought ~ +1,350 MW
 - Desalinization ~250 MW salt water plus 250 MW desalting groundwater = +500 MW
 - Electrification of ag diesel pumps = +350 MW
 - Increased treatment requirements = +160 MW
 - Increased water marketing - +230 MW
 - Increased recycled water use - +685 MW
- Unknown demand increasers
 - Drought/climate change - unknown
 - Increased population impacts - unknown

Water Agency Options

- Water agency solutions to California electricity problems
 - Additional peak demand curtailment
 - Additional storage
 - Water Customer demand side options
 - TOU water meters/tariffs
 - Water agency generation
 - 500+ MW of standby generators available
 - Hydro - 1,631 MW existing, +255 MW new small
 - Biogas - 38 MW, 36 MW new potential
 - Natural gas engines - existing ~100 MW, 200 MW additional potential
 - Solar - 5 MW, +100MW potential



Policy Recommendations/Research Needs

- **Peak Demand Reduction**

- Cost vs. peak demand benefit of increased storage
- Water agency generation options
 - inventory and implementation hurdles investigation
- Development and case studies in customer TOU water rates
 - TOU water meter development
 - TOU water tariffs
 - Peak shift response of water customer

- **Generation**

- **General** - allow aggregation of water agency meters to qualify for net metering, similar to what is happening with demand response programs
- **Solar** - increase available pool of rebate money to allow additional water agencies to install solar, increase contracting timeframe after reservation notification to account for longer public agency decision making time

- **Demand Response Programs**

- ***A multi-year program*** - so water agencies can have some investment recovery period
- ***A demand payment for participation in the program*** - to cover necessary capital investment costs
- ***Payment of a fixed risk premium*** - water customers won't be impressed if their district saved the state if they run out of water, pressure, fire protection, or are required to boil water
- ***A per-event payment*** - to cover additional staffing requirements, component wear and tear, and replacement water costs
- ***Has a reasonable verification criteria*** - 10 day rolling average doesn't work - needs to be adjusted for load reduction from previous hour
- ***Accurate and timely settlements*** - hassles with payments, or waiting months, cools ardor for the program
- ***Adequate curtailment notification*** - in time to prepare and staff up for curtailment event

- **Utility Incentives**

- ***Water agency specific technologies*** - such as increased storage, water parameter sensors, and controls - should be eligible for utility demand reduction incentives

- **Conservation Credits**

- Water saving measures that also save energy - should be given credits for both

- **Water Customer Demand Response Needs To Be Investigated**

- Time of Use water meters need to be developed and demonstrated and Time of Use water tariffs need to be developed, implemented, and their effectiveness in shifting demand analyzed

- **Energy Impacts -**

- ***New Regs*** - Energy impacts and costs of new and existing water regulations should be specifically addressed
- ***New Development*** - Energy impact and costs of supplying water for new development needs to be considered
- ***New Supply*** - Energy requirements and costs of new/additional water supplies need to be addressed